With a manometer 86, the air pressure currently prevailing in the tire-pressure regulating system according to the invention is displayed to an operator. In this respect, an ability for the operator to inspect the operation of the tire-pressure regulating system is realized.

The following describes the work steps which are to be performed by a vehicle operator or by the tire-pressure regulating system according to the invention from Figure 2, in order to achieve an increase in tire pressure. Thus, up to four hose couplings 66 rolled up into circles are removed from the storage containers provided on the vehicle and connected by the vehicle operator, on one side, to the quick-connect coupling 67 and, on the other side, to the valve 68. Then the vehicle is brought to fast idling with standard gas, wherein the combustion engine 20 then exhibits an rpm of greater than 2000 rotations per minute. By activating the switch 87, the vacuum pump 88 is turned on, which changes the low-pressure diaphragm dashpot 48 with low pressure, which changes the geometry of the guide blades 60 of the turbocharger 22. In this way, the compression of fresh air by the turbocharger 22 is increased. After the desired air pressure has been established in the tire 16 of the vehicle, which the vehicle operator checks using the manometer 86, the switch 87 is activated again, so that the guide blades 60 of the turbocharger 22 return to their original geometry. In this way, the standard gas is brought back to normal idling. The period for filling four tires to an air pressure of ca. 1.6 bar equals less than 2 min for a vehicle embodied in the form of a tractor with the tire-pressure regulating system according to the invention. Finally, the hose couplings 66 are to be decoupled from the vehicle and wheel sides and stored in the corresponding storage containers. The vehicle is then ready to be driven.

The work steps provided for deflating the tire or reducing the air pressure differ from the steps just described essentially in that after connecting the connecting line 62 to the hose couplings 66, the solenoid valve 80 is opened and the vehicle operator monitors the falling pressure profile on the manometer 86. When the desired air pressure is reached, the solenoid valve 80 is closed. Here, for a tractor, an emptying time of the four tires 16 of less than one minute can be achieved.

Even though the invention was described merely with reference to embodiments, in light of the previous description and also the drawing, many different alternatives, modifications, and variants which fall under the present invention open up for someone skilled in the art.

Claims

1. Tire-pressure regulating system for setting the pressure of a tire (16) mounted on a vehicle, with a compressed-air source, wherein the vehicle has a combustion engine (20) with a turbocharger (22) and wherein the turbocharger (22) is provided as a compressed-air source for the tire-pressure regulating system (10), characterized in that the turbocharger (22) has a variable geometry.

2. Tire-pressure regulating system according to Claim 1, characterized in that the geometry of the turbocharger (22) can be changed by an adjustment of the guide blades (60) and/or the working blades.

3. Tire-pressure regulating system according to Claim 1 or 2, characterized in that the guide blades and/or the working blades are changed with reference to a charged air compressor part of the turbocharger (22).

4. Tire-pressure regulating system according to one of Claims 1-3, characterized in that the guide blades (60) and/or the working blades are changed with reference to the exhaust gas turbine part of the turbocharger (22).

5. Tire-pressure regulating system according to one of Claims 1-4, characterized in that the geometry of the turbocharger (22) can be changed with the help of a high-pressure or low-pressure diaphragm dashpot (48) connected to the turbocharger (22), wherein a preferably electrically-driven vacuum pump (88) connected to a low-pressure diaphragm dashpot (48) charges the low-pressure diaphragm dashpot (48) with low pressure.

6. Tire-pressure regulating system according to Claim 5, characterized in that the high pressure or low pressure between the vacuum pump (88) and the high-pressure or low-pressure diaphragm dashpot (48) can be reduced, so that the turbocharger (22) assumes its geometry corresponding to this state.

7. Tire-pressure regulating system according to one of Claims 1-6, characterized by a controller (50), with which the change in the geometry of the turbocharger (22) can be controlled or regulated, preferably with the help of electrical signals.

8. Tire-pressure regulating system according to one of Claims 1-7, characterized in that there is at least one pressure sensor (46, 54) and/or temperature sensor, which detect the pressure or the temperature on the suction-side and/or the exhaust gas-side of the combustion engine (20).

9. Tire-pressure regulating system according to Claim 7 or 8, characterized in that information on the rpm and/or the load on the combustion engine (20) can be fed to the controller (50) of the tire-pressure regulating system (10).

10. Tire-pressure regulating system according to one of Claims 7-9, characterized in that the controller of the combustion engine (20) can be expanded by the functionality of the controller (50) of the tire-pressure regulating system (10).

11. Tire-pressure regulating system according to one of Claims 1-10, characterized in that a function can be defined, with reference to which the geometry of the turbocharger (22) is changed.

12. Tire-pressure regulating system according to Claim 11, characterized in that the function depends on the profile of the charged air pressure after the compression stage of the turbocharger (22).

13. Tire-pressure regulating system according to one of Claims 7-12, characterized in that an additional function can be defined, wherein the geometry of the turbocharger (22) is changed such that the functional values of the additional function are not exceeded.

14. Tire-pressure regulating system according to Claim 13, characterized in that the additional function depends on the rpm of the turbocharger (22) resulting from the change to the geometry of the turbocharger (22).

15. Tire-pressure regulating system according to one of Claims 1-14, characterized in that the current turbocharger geometry can be determined—especially with the help of sensors—and can be fed preferably to the controller (50) of the tire-pressure regulating system (10).

16. Tire-pressure regulating system according to one of Claims 1-15, characterized in that the rpm of the combustion engine (20) can be operated within preset rpm limits when adding air to or letting air out of the tire.

17. Tire-pressure regulating system according to one of Claims 1-16, characterized in that a waste-gas valve (44) can be connected to the charged air channel (38) of the combustion engine (20).

18. Tire-pressure regulating system according to one of Claims 1-17, characterized in that another air compressor (42) is connected after the turbocharger (22).

19. Tire-pressure regulating system according to one of Claims 1-18, characterized in that a charged air cooler (63) is provided in the suction channel between the turbocharger (22) and the combustion engine (20).

20. Tire-pressure regulating system according to one of Claims 1-19, characterized in that for filling a tire (16) with air and/or for letting air out of a tire (16) there is at least one connecting line (11; 62, 66) between the turbocharger (22) and a wheel.

21. Tire-pressure regulating system according to Claim 20, characterized in that the connecting line (11; 62) is mounted permanently to the vehicle at least in sections, wherein a rotary transmission leadthrough (12) is provided preferably for transmitting the air between the rotating wheel and the stationary part of the vehicle.

22. Tire-pressure regulating system according to Claim 20 or 21, characterized in that the connecting line can be connected by hand at least in sections, preferably by means of flexible hose couplings (66).

23. Tire-pressure regulating system according to Claim 22, characterized in that one end (72) of a hose coupling (66) can be connected reversibly to a wheel-side coupling system (68), preferably to a quick-connect system.

24. Tire-pressure regulating system according to Claim 23, characterized in that the other end (70) of a hose coupling (66) can be connected, preferably reversibly, to a vehicle-side coupling connection (64).

25. Tire-pressure regulating system according to one of Claims 22-24, characterized in that at least one end of a hose coupling (66) has a self-locking quick-connect coupling, which is not locked in the state coupled to the coupling connection (64, 68).

26. Tire-pressure regulating system according to one of Claims 22-25, characterized in that a hose coupling (66) and/or a connecting line (11; 62) has at least an open diameter of 1/2 in, i.e., approximately 1.3 cm.

27. Tire-pressure regulating system according to one of Claims 1-26, characterized in that there are means (44) with which the air pressure of the air moved into a tire (16) has an upper limit, preferably by means of an automatic pressure switch.

28. Tire-pressure regulating system according to one of Claims 1-27, characterized in that there are means (76) with which the air pressure of the air moved from a tire has a lower limit, preferably by means of an automatic pressure switch.

29. Tire-pressure regulating system according to one of Claims 1-28, characterized in that there is a non-return valve (82) arranged between the turbocharger (22) and a tire (16) and which prevents a high pressure coming from the tire (16) from acting on the turbocharger (22).

30. Tire-pressure regulating system according to one of Claims 1-29, characterized in that there are means (84) for damping the sound generated when air is let out of the tire (16), wherein the means (84) preferably have a pressure-limiting valve for damping the sound.

31. Tire-pressure regulating system according to one of Claims 1-30, characterized in that there is a manometer (86) which displays to a vehicle operator the air pressure in the tire-pressure regulating system (10) or in the tire (16).

32. Tire-pressure regulating system according to one of Claims 1-31, characterized in that each tire of the vehicle can be set with a different air pressure, wherein preferably the tires allocated to each axle of the vehicle have essentially the same air pressure.

33. Tire-pressure regulating system according to one of Claims 1-32, characterized in that the air pressure of the tire of a trailer that can be coupled to the vehicle can be adjusted with the tire-pressure regulating system, wherein preferably the air pressure of a tire of the trailer can be set different than the air pressure of a tire of the vehicle.